

Flightfax®

Online newsletter of Army aircraft mishap prevention information



AR 385-10 outlines the requirements for The Army Safety Program. In general terms, commanders are charged with the responsibility to establish, emphasize, resource, evaluate, and ensure a vital, organization-wide safety program.

DA Pam 385-90, Army Aviation Accident Prevention Program, tells you aviation operations involve inherently higher risk than most ground operations. Because of this, commanders of units involved in aviation operations must emphasize the safety component of protecting the force. It gives guidance on the aviation accident prevention program which can be more accurately described as a program of programs involving aviation safety and the integration other safety-related programs.

The prevention of foreign object damage (FOD) to aircraft is an essential part of each unit's aviation accident prevention program and is emphasized in this issue. For many, the flight line FOD walk is what comes to mind when a FOD prevention program is mentioned. The 'blast from the past' article reflects a much broader picture of what a FOD prevention program entails. An accompanying mishap review from not so many years ago is also included. It relays the most serious of consequences – loss of life - as well as loss of an aircraft due to a FOD related accident.

As with any safety-related program success is often based on the emphasis the commander places on it, the quality of the individual(s) charged with running the program and the culture created by the participation of unit members. This makes the FOD walk more than just a police call. It instills the value of participation in the safety program. This is represented by the fact that in good programs you don't pick up FOD items only on the designated walk day, but any time you encounter it. A good program ensures post-maintenance inspections are properly completed and tool accountability is enforced to maintain the high standards required to prevent accidents.

Also included this month is an article from DES addressing some of the common issues experienced during visits and includes specific recommendations for UAS units. Additionally, there is another mishap review on a recent dust landing accident. Dust landings continue to be a challenge.

In closing, this month we bid farewell to COL Mike Higginbotham, the Aviation Director here at the Combat Readiness Center, as he departs for senior service college and wish him the best of luck on his future endeavors. We'll utilize his sign-off one last time.

Until next month, fly safe and manage your risk levels!

Aviation Directorate, Future Operations
U.S. Army Combat Readiness Center

Mishap Review: HH-60M Dust Landing

During the conduct of a dust landing, the main rotor blades of the HH-60M contacted and damaged the tail rotor drive shaft. As the collective was increased for takeoff, the drive shaft broke causing the aircraft to spin uncontrolled in a clockwise rotation. The aircraft impacted the ground in a clockwise spin causing damage but no injuries.



History of flight

The accident unit aircraft was performing Medical Evacuation (MEDEVAC) duties or “First Up” in support of combat operations. The accident crew was briefed and approved to conduct continuation training flights by the task force commander. The planned training flight was to include traffic patterns, roll-on landings, visual meteorological conditions (VMC) approaches, and hovering flight which was approved by the brigade commander.

At 0925L, the crew participated in a daily synchronization meeting which consisted of an Operations and Intelligence (O&I) update brief, training being conducted that day, and assumption of duty brief. The assumption of duty brief included the Air Mission Brief (AMB) and multi-ship brief with the crew of the second MEDEVAC aircraft. At 1000L, the accident crew conducted a pre-flight inspection of their aircraft and crew mission brief, after which the crew and aircraft were postured for duty. The weather was winds 270 degrees at 06 knots. Visibility was unrestricted. Sky condition was FEW clouds at 25,000 feet. Temperature was 20 degrees Celsius with DEW point -09 degrees Celsius. Altimeter setting was 30.11 in/Hg. Pressure Altitude was 2204. Sunset was at 1820L, EENT at 1913, and illumination at 23% at 33 degrees above the horizon.

At 1900L the crew met at the aircraft and conducted a crew brief for their training flight. At 1930L the aircraft repositioned and conducted their health indicator test (HIT) check on their engines and confirmed the weight with the flight management system. With the PI on the controls, the accident aircraft repositioned to the runway and conducted continuation training which included traffic patterns, VMC approaches, roll-on landings, hovering flight, and a practice autorotation. The crew then repositioned and refueled the aircraft to keep it in a state of readiness for MEDEVAC duty. After refueling, the crew decided to practice some dust landings. The SP discussed the different techniques for dust landings as the PI flew the aircraft to where they would conduct environmental training.

With the PI on the controls, a “Go Around” was called for the first two VMC approaches. The first was due to the slow airspeed and the second, a fence post and wire were observed. The third approach terminated to the ground with some forward roll. The forth landing had a higher rate of descent at touchdown. During the landing sequence, there was a flight director fail and master

caution, which the SP reset. The SP took the flight controls and informed the crew they were going to conduct another iteration. As the SP increased collective for takeoff, the aircraft began to spin uncontrolled in a clockwise rotation. The SP immediately announced he had a tail rotor problem and lowered the collective. The aircraft impacted the ground in a clockwise spin causing moderate damage and no crew injuries.

Crew Experience

The SP/PC, sitting in the left seat, had over 2,700 hours total time with 2,100 in the UH-60A/L, 75 UH-60M, 1,160 IP hours, 650 NVG and nearly 1,300 combat. The PI had a total time of 386 hours with 300 in the UH-60, 70 UH-60M, 75 NVG and 24 combat.

Commentary

The investigation determined that during the conduct of the approach the aircraft exceeded a decent rate of greater than 300 feet per minute at landing. The pilot on the controls then applied excessive aft cyclic to aid in slowing the aircraft. Two of the main rotor blades, undetected by the crew, contacted the tail rotor drive shaft, damaging two of the main rotor blade tip caps, the intermediate gearbox cover, and section III of the tail rotor drive shaft. The damaged drive shaft failed when the crew initiated a follow-on takeoff.

Manned Aircraft Class A – C Mishap Table as of 26 May 15										
	Month	FY 14					FY 15			
		Class A Mishaps	Class B Mishaps	Class C Mishaps	Fatalities		Class A Mishaps	Class B Mishaps	Class C Mishaps	Fatalities
1 st Qtr	October	0	0	2	0		0	1	3	0
	November	3	0	5	0		2	0	1	2
	December	1	0	4	0		1	1	2	0
2 nd Qtr	January	2	2	4	4		2	0	6	0
	February	1	0	3	0		0	0	0	0
	March	0	3	0	0		2	1	9	11
3 rd Qtr	April	1	1	7	0		0	1	0	0
	May	4	0	3	2		1	2		
	June	2	1	7	0					
4 th Qtr	July	2	0	5	0					
	August	0	0	1	0					
	September		1	5	0					
Total for Year		16	8	46	6	Year to Date	8	6	21	13
Class A Flight Accident rate per 100,000 Flight Hours										
5 Yr Avg: 1.33			3 Yr Avg: 1.28			FY 14: 1.52			Current FY: 1.46	



Unmanned Aircraft System (UAS) Unit Training

Sergeant First Class Matthew Clubb
Directorate of Evaluation and Standardization
U.S. Army Aviation Center of Excellence
Fort Rucker, Ala.
UAS Standardization Operator

Since 2005, the UAS Branch of the Directorate of Evaluation and Standardization (DES) has evaluated and assessed many units and assisted with several FORSCOM ARMS Inspections. The primary mission of the UAS branch is not only to assess the Aircrew Training Program (ATP), but to provide mentorship to unit standardization personnel with the goal of improving the unit. The following article addresses some of the common issues experienced during visits and includes specific recommendations for UAS units.

UAS is unique in Army aviation for many reasons; one of them being that the majority of our operators, instructor operators and standardization instructor operators are enlisted. While a UAS operator may not be a pilot in the most traditional sense, they are most certainly aviators. Currently, the Army is integrating UAS units into Full Spectrum Combat Aviation Brigades, developing doctrine and including UAS requirements into existing aviation regulations. In the near future, manned and unmanned requirements will be part of the language and experience of all aviation units. Whether manned or unmanned, all aviators must be able to understand requirements, capabilities and doctrinal principles about how Army aviation will fight and win as a team. Army aviators are much more than pilots of aircraft. All aviators, whether manned or unmanned, must be professional aviators and warfighters, well versed in doctrinal principles and, most importantly, trained and ready to be force multipliers high above the rest.

One of the major issues facing the UAS community is quality training. While this comes across as an obvious statement, it is often incorrectly justified as a lack of opportunity to train. I have first hand experience of the pains of trying to get range control on board with flight operations and getting air space, ground space and facilities to conduct flight operations. This is a reoccurring problem for all UAS units. To alleviate last minute confusion or cancellation of important training UAS operations must be scheduled and deliberate to the maximum extent possible. UAS training must be scheduled on the unit training calendar in order to ensure proper coordination for airspace, ranges etc. During a majority of visits, standardization personnel must be asked when and what training will be conducted since the training is not included on training calendars. In many cases, training time is lost due to little or no coordination between the company and higher headquarters.

Individual training is the foundation of our ability to conduct combat operations and should be continuous; from RL progression, to daily operations, into the APART. As UAS leaders it is incumbent upon us to continually train our aircrews by all means available. Simulation, academic classes or table talking required tasks are among many tools that we have at our disposal to train outside of live flight. Since my tenure at DES, I have seen what appears to be an upward trend in the individual proficiency of operators in regards to technical operations of the aircraft, which speaks to the progress we are making as a community.

To say that we are making progress, however, is not to say that we have arrived. We must do a better job of developing our tactical sense, situational awareness, and instilling a sense of tactical curiosity within our aircrews. All of our training flights should be scenario based; and include collective and METL tasks to the maximum extent possible. We must break the habit of putting the

aircraft into the air with no task and purpose in order to take advantage of every training opportunity. Due to the autonomous nature of our aircraft, we can start to introduce our flight crews in mission type flights earlier in the training cycle; i.e. we don't have to be concerned with things such things as power management, auto-rotations, etc. This allows us to spend more time teaching warfighting tasks, fundamentals of reconnaissance and radio operations.

An area of improvement that is always of great benefit to UAS formations is mentorship of UAS instructors. A solid training program at a unit will identify potential IOs quickly and it is incumbent on standardization personnel to identify potential and mentor and groom crewmembers for greater positions of responsibility. Once identified, these crewmembers should begin a period of training that will indoctrinate them with skills for records maintenance, ATP Integration/Management, fundamentals of instruction and the evaluation process. This mentorship should begin well before a proficient operator goes to the instructor operator course and continue throughout and individual's career.

The benefits of aviation mentorship inside of UAS formations cannot be understated. Integration of UAS into combat aviation brigades has been a long time coming, but will have great benefits to Army aviation. Assigning UAS units to established aviation units with experienced standardization personnel has proven to be very successful and ends with trained, ready and relevant UAS units available to provide aviation support to our brothers on the ground. In order for the integration to be effective, the entire aviation community has to be involved in order not to succumb to the same issues, problems and concerns that we have learned since becoming an aviation branch. It may seem a daunting concept to treat manned and unmanned aviators alike, but the end payoff will be worth the effort. The flight operations, safety and standardization of UAS operations and training can be positively augmented by good communications and mentorship between unmanned and manned standardization personnel.

UAS Unit Recommendations:

- Identify and mentor potential instructor operators by developing and enforcing a quality unit trainer program. Although they cannot evaluate, UTs can enhance unit training and learn records maintenance, ATP Integration/Management, and fundamentals of instruction prior to attending the IO course.
- Seek out experienced aviation leaders for mentorship and development of quality academic training programs. These personnel may or may not be in your unit. It is important for the community to remember that the majority of RQ-7B Shadow formations are not assigned to aviation units.
- Ensure training schedules are used to maximize available training time. Include in these schedules all ranges of academic, flight, simulated flight and integration training.
- Take unit training plans and be sure warfighting and reconnaissance tasks are reinforced as well as individual aircraft tasks. IOs need to ensure they are proficient warfighters and verify that adequate training time goes to how to fight and not just how to fly.
- Develop collective and mission training that is conducted with other army aviation assets. Increasing familiarity between the manned and unmanned communities will only strengthen Army aviation on the battlefield.
- The SP's, Master Gunners, and S-3's in aviation units with UAS assets assigned have to reach out and embrace the UAS operators, include them in pilot's calls, ensure that all operators on the

mission will attend briefs and debriefs, when able, integrate them into your SOPs and risk assessments, give and receive academic and operational classes from each other. If we truly integrate UAS into our manned units, we are only limited by our imaginations on the employment of a formation that will bring an unparalleled force multiplier to ground commanders.

--SFC Matthew Clubb, DES UAS Standardization Operator, may be contacted at (334) 255-1449, DSN 558.

UAS Class A – C Mishap Table										as of 26 May 15
	FY 14					FY 15				
	Class A Mishaps	Class B Mishaps	Class C Mishaps	Total		Class A Mishaps	Class B Mishaps	Class C Mishaps	Total	
MQ-1	6		3	9	W/GE		1	1	2	
MQ-5	1	1		2	Hunter	1		1	2	
RQ-7		12	11	23	Shadow		2	5	7	
RQ-11			1	1	Raven			1	1	
RQ-20			1	1	Puma					
YMQ-18										
SUAV					SUAV					
UAS	7	13	16	36	UAS	1	3	8	12	
Aerostat	3	2	3	8	Aerostat	1	0	0	1	
Total for Year	10	15	19	44	Year to Date	2	3	8	13	

Random Finding from the archives. FINDING 1 (Present and Contributing – Human Error): While flying a UH-60A helicopter on an external load mission, the aircrew allowed the load, an empty pallet, to “fly” into the tail boom of the aircraft and subsequently enter the rotor system. This event rendered the helicopter uncontrollable and resulted in a tail boom separation, a right roll, and impact in a near inverted attitude. A post crash fire ensued which resulted in the complete destruction of the aircraft and one fatality. This mishap was the result of the copilot’s inattention to his most critical flight element, airspeed. Immediately following a transfer of controls from the pilot and while the pilot was tuning radios, the copilot allowed the airspeed to increase 10 to 15 knots in excess of the airspeed designated as the maximum (55 knots) by the pilot. This increase was sufficient to produce aerodynamic lift on the empty cargo pallet causing it to start flying. Once this sequence had begun, the pallet entered the rotor system before the crew could react. The copilot’s inattention is attributed to his relative inexperience in transporting non-typical loads and the lack of adequate operator’s manual cautions concerning such loads. Specifically, the absence of appropriate cautions allows inexperienced aviators to become overconfident in the aircraft’s performance capabilities. In this case, both pilot and copilot were aware of the unstable potential of their load; however, neither were aware that when the load initially became unstable, it was already too late to take corrective action. An operator’s manual caution which restricts forward airspeed to effective translational lift (ETL) or below for such non-typical, light, aerodynamic loads would serve to properly caution aviators and cause the less experienced pilot to consider such characteristics in all external load operations.

Mishap Review: FOD Related Mishap

While conducting a two-ship extraction in support of combat operations under NVGs, the aircrew experienced a loss of tail rotor thrust. The aircraft spun multiple times and crashed. All four crew members and ten passengers received fatal injuries and the aircraft was destroyed.



History of flight

The mission for the flight was to conduct a night extraction of a scout team which had been inserted the previous night in support of combat operations. The mission was planned, briefed, and approved. The flight was to last approximately one hour with two OH-58Ds in over-watch positions, while two UH-60s conducted simultaneous landings in two separate pick-up zones. The mission was briefed by the platoon instructor pilot and approved by the battalion commander.

The crews reported for duty at 1600L with a preflight time of 1900. The crew received the mission/threat update briefing at 2000L. The AMC conducted a team briefing at 2030L and the crews performed a crew briefing at their respective aircraft prior to departure. The mission was assessed as a medium risk.

The flight of two UH-60s departed at 0018 en route to the pick-up zone with the accident aircraft flying Chalk 2. The flight arrived at the PZ at 0044L. Chalk 1 attempted four approaches and executed four go-arounds due to brown out conditions before landing safely and loading their team of 10 scouts. Chalk 2 attempted two approaches (due to dust), landed safely and picked up the remaining 10 scouts. The trail aircraft announced to lead they were ready for take-off. The flight then departed at approximately 0049L and made a right turn en route to home base. At 0050L Chalk 1 received a radio call from Chalk 2 announcing that his aircraft had a "Tail Rotor Quadrant" caution light and would return to the FOB. Soon after, Chalk 2 made a radio call that their aircraft was "going down." The two OH-58Ds in over watch position witnessed the aircraft slow down, pitch up, spin to the right, and impact the ground.

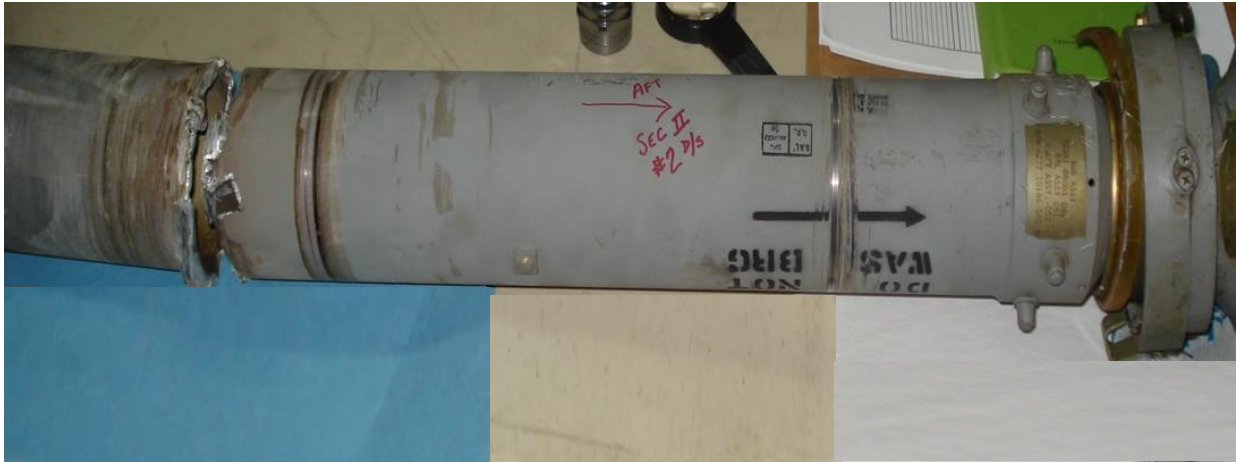
Crew Experience

The PC/AMC, sitting in the left seat, had nearly 1,000 hours total time with 800 in the UH-60, 300 PC hours, 200 NVG and 330 combat. The PI had a total time of 470 hours with 285 in the UH-60, 82 NVG and 100 combat. The CE had incomplete records but showed over 125 total hours with 100 in combat and 54 NVG. The OR had 125 hours total time with 90 combat and 31 NVG.

Commentary

The investigation determined the aircrew lost all tail rotor control due to failure of the section II number two tail rotor drive shaft. This resulted in the aircraft spinning multiple times to the right and subsequent crash. It was determined the drive shaft sheered due to the effect of an

unidentified object in the area of the section II number two drive shaft. The drive shaft had several scoring marks with one very deep cut where the failure occurred. The investigation was not able to identify the specific mechanism that caused the deep scoring on the drive shaft, but suspects an unknown maintainer or crewmember left either a tool or other materiel that scored the drive shaft. The aircraft had recently its first phased maintenance inspection including foreign object damage (FOD) inspections conducted in accordance with (IAW) the unit standing operating procedures and published maintenance procedures. A unit tool box inventory was conducted with no reported losses.



FOD findings from the archives for your review

FINDING: As the aircraft was climbing thru 500 feet AHO at 100 KIAS the crew began experiencing load bangs and a temperature increase up to 851 degree on the #2 engine. The PIC diagnosed and announced the malfunction as a compressor stall. The PIC identified the #2 engine power control lever and was confirmed by the CE, he then retarded it back to idle. The aircraft landed and taxied back into parking with no further damage or injuries. Upon post-flight inspection, it was discovered that both #1 and #2 inlet plugs were still installed in the engine inlets.

FINDING: While completing a normal approach to an LZ marked with three VS-17 aerial marker panels, one of the panels and an attached metal tent peg were blown out of the ground by rotor-wash. This debris was carried into the air and impacted the main rotor system. The aircraft was shut down immediately thereafter without further incident. Post-flight inspection revealed a quarter size hole, and several small dents on one main rotor blade.

FINDING: Aircraft experienced engine surges while running on the ground. After shutdown the engine shop inspected the inducer bleed port filter hose where they identified small pieces of paper. The crew chief then removed the left side engine barrier filter (EBF) and found a shop towel in front of the engine compressor.

FINDING: A 12-inch adjustable wrench was left on top of the aircraft, and presumably, during engine start and run-up procedures, was projected from its resting position into the forward rotor disk resulting in damage to two forward rotor blades.

Blast From The Past

Articles from the archives of past Flightfax issues – This article from the 21 January 1981 issue

FOD is picking up

FOD-foreign object damage-was once one of aviation's minor problems. Over the years the problem has built up. Various things-loose change, nuts and bolts, stray tools- have been jamming controls and other moving parts since before Lindbergh's day. During World War II, pilots swore that little men called Gremlins went around at night distributing foreign objects the way Santa Claus hands out gifts at Christmas-only with different purposes in mind. And since the helicopter came along, blades have been chewed up by everything from turkey buzzards to ham sandwiches.

Then along came the turbine engine. Overnight the situation changed from bad to worse. If you were to make up a list of all the foreign objects which have interfered with turbines' innards from time to time you would have a list long enough to fill a mail order catalogue. Sand, gravel, loose change hauled out of mechanics' pockets along with their handkerchiefs, assorted military insignia, straw and hay, tools, flashlight batteries, nuts and bolts, and what do **you** have loose around you right now a turbine or rotor **won't** eat?

The point to be noted about FOD is that the foreign object involved doesn't have to be the size of a basketball or a pair of overalls to interfere with a turbine's digestive system. That fishhook you have in your tackle box might not be big enough to handle anything above the size of a minnow. Try sticking it in your ear if you want to see what even a small object in the wrong place can do.

FOD is a source of reduced efficiency which can pile up faster than snowdrifts in a North Dakota blizzard. When foreign objects cause turbines to run high fevers, you wind up with more maintenance piled on already overworked mechanics and more aircraft sitting around out of commission. What is more important, operational missions have to be curtailed or reduced, meaning that some poor soul somewhere else goes without the air support he desperately needs.

It's like that old story about the king who lost the battle because his horse lost his shoe - and the shoe dropped off because it needed a nail. This might be called FOD-in-reverse. Nobody ever has discovered what happened to the nail, but one thing's for sure: It wasn't where it was **supposed** to be when it was needed.

A foreign object which lodges where it is **not** supposed to be at a critical moment can be just as costly. A lot of people get involved.

Sounds pretty grim, doesn't it? It's a problem, all right, and a major one at that. But if you're the courageous type who will agree that sticking your head in the sand is no way to fend off attacking lions, you'll go along with the theory that **any** problem can either (a) be eliminated or (b) reduced to manageable proportions if it is handled the right way. Medical pioneers long ago demonstrated this when they set out to eliminate various unpleasant ailments such as beriberi, yellow fever, and polio. If they had sat around muttering about how tough things were there wouldn't be much of a population problem today.

We might as well start on a solution by being honest. Until some bright lad comes up with an Instant Automatic Handy-Dandy Foreign Object Eliminator it's a problem we will always have in some degree, the way some people have football knees or tennis elbows.

It's a sure fact the dangers you **know** about are the ones you can **do** something about. Once everybody in Army aviation is aware of how lethal FOD can be, what kind of a problem it really is, and what to **do about it**, its size as a problem will shrink considerably.

Continued on next page

All hands alert

Check that **everybody**, folks. FOD is one problem which every person in an aviation unit can have a hand in (a) causing or (b) solving. Even if the table of organization called for a special FOD officer, section, or platoon, foreign objects could still creep in and snuggle up inside turbines unless the entire unit is on the alert. Let's take a look at some of the openings which foreign objects can take advantage of when collective backs are turned.

- Grease on a mechanic's shoes picks up bits of gravel which in turn is deposited on a walkway where the turbine can get at it.
- Litter-paper cups, oily rags and the like- is allowed to accumulate along ramps and runways where wind blows it onto the flight line.
- A mallet is left in an intake by a forgetful mechanic.
- Loose objects accumulate in cockpits (a paper clip can do the job nicely if it hides in the right place).
- Foreign objects are introduced into parking areas by snow removal operations.
- Panel markers anchored in mud or loose
- Buckets-don't laugh, it's happened-wooden blocks and similar unsecured items in baggage compartments.

And so on and so on. If you put one person to work on the problem he'd end up climbing the walls at the funny farm.

Basically, it's a matter of good housekeeping, a happy arrangement under which every member of the household takes pride in keeping the pad straight. If Mom spends all day cleaning up while Pop sits in front of the TV set rolling empty cans under the sofa and sprinkling ashes on the rug, and Fido is shedding hairs on the best chairs, the joint is going to look like a devastated area no matter how hard she works.

The same goes for Army aviation. When everybody has the kind of pride his job demands- pride in the unit and its record and pride in himself as a professional- rooting out foreign objects before they can do the damage becomes an automatic reflex, like swatting flies.

The all-out assault on FOD is a team effort, like any good military operation. The trouble is that in any operation, like furniture moving, some unfortunate person always is handed the heavy end of the load. Some poor soul has the job of sweeping up after the parade has gone past.

As far as FOD is concerned, the maintenance people get the task of carrying the ball about the same proportion of times as the running back on a pro football team. The mechanics, supervisors, inspectors, and the rest of the experts charged with the job of keeping aircraft hale and hearty work in areas where foreign objects are spawned and where they are likely to do the most damage. So it falls on them to get rid of potential FOD down where it usually begins.

What's sadder to relate, maintenance personnel not on the alert can bring on FOD the way Typhoid Mary used to spread germs around the land like a crop duster. Anybody who doesn't pay proper attention to his job in Army aviation sooner or later will cause trouble for somebody else. And bringing on FOD is the easiest and surest way to do it.

Take tools, for example. Needle nose pliers left where they can fall into engines or jam controls. Oily rags and paper served up to hungry turbines like TV snacks. Mallets, hammers, and a hundred or so other kinds of gadgets lying around loose in cockpits and other areas they'd no business being in.

Sloppy? You can say that again. What is worse, it's unprofessional, and the Army has about as much use for a bumbling amateur as the Philadelphia Eagles.

Toolbox sense

One mark of the sure professional in any trade is the respect he has for his tools. Where would Joe the Safecracker be today if he was in the habit of leaving his drills behind at the scene of the crime? In Sing Sing, that's where. If you ever consult a surgeon and he starts patting his pockets and mumbling about a lost scalpel you'd do well to hunt up another sawbones.

When they put you under for the operation, you want to feel it is being performed by a real pro, even if it's only for an ingrown toenail. Pilots, aircrew members, and passengers aboard Army aircraft feel the same way about maintenance personnel. It doesn't help their state of mind if they have to keep wondering if **their** mechanic was some absentminded knucklehead with 10 thumbs.

Absentminded knuckleheads are about as numerous in Army aviation as dinosaurs in downtown Chicago. But how about those needle nose pliers and those oily rags? They are solid evidence that maintenance goofs do occur, that some people aren't always performing like the real pros they've been trained to be. We'll grant there can be reasons-fatigue, haste, pressure, overwork and all the rest. But you can't tell that to a turbine trying to spit up a pair of pliers.

One sign of a real pro is the solid organization he brings to his work. A golf pro organizes the clubs in his bag the same way every time he goes out on the course. A football coach organizes his bench to avoid sending in the waterbody instead of the quarterback.

A professional aviation mechanic's toolbox is a model of organization. In the first place, it helps him get the job done faster and more efficiently, with less wear and tear on his nervous system. As far as FOD is concerned, the toolbox is a model **before** the job begins and **after** it is over. Everything is where it should be-in the box or in actual use. No needle nose pliers will ever get a turbine in trouble if they are accounted for, in their proper slot, and under lock and key when the aircraft goes out to the flight line.

Toolbox inventory is one of the heaviest weapons maintenance personnel have in the front-line war on FOD. For one thing, it helps them sleep better at night. Generally, when an aircraft crashes because a tool is left where it shouldn't be, nobody knows who was responsible. Except for one person.

One big family

The toolbox inventory is mostly a matter of individual responsibility and sound training, like the use of any personal equipment.

But a properly trained unit can develop the kind of pride the FOD war calls for-and here the maintenance personnel in the front lines of the battle are joined by everybody from the commander on down. Take the case of an aircraft cockpit. As somebody has neatly put it, a cockpit is a pilot's place of business and the maintenance people are his office managers. It's a team, a family relationship, and when it works properly it's the kind of family marriage counselors like to dream about.

A pilot has a right to raise sand if he comes to work to find enough rubbish strewn around to start a rummage sale. The maintenance person has an equal right to feel a little tired, and to mutter bad words under his breath, if **he** arrives at a cockpit which looks like the floor of a dime store lunch counter after the noon rush. It's a two-way street.

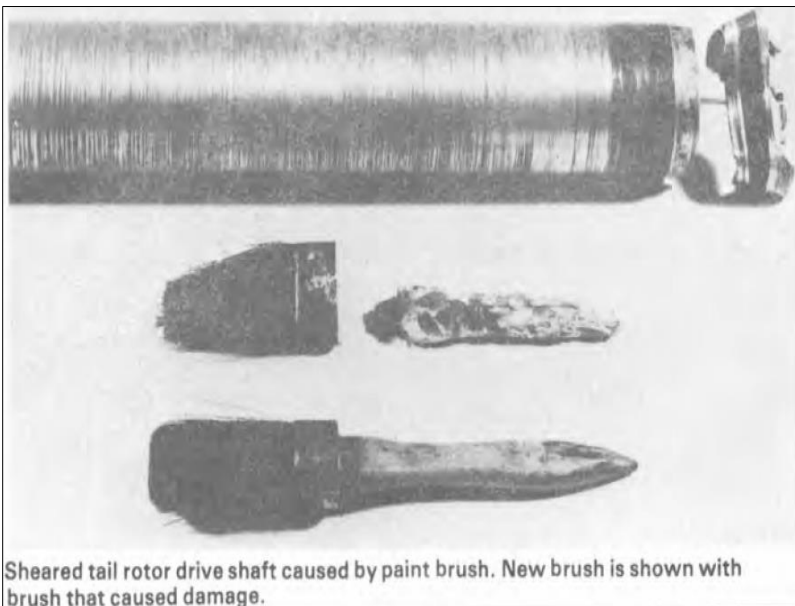
In FOD-conscious units this doesn't happen. A pilot who realizes what a foreign object can do to his controls, his engine or his rotors, keeps everything - ham sandwiches, canteens, map cases, extra jackets-as shackled as a chain-gang convict to keep them out of trouble. And the mechanic- well we know how a professional FOD-hating mechanic feels about things being out of place.

It's a two-way street **outside** the aircraft as well. Your FOD-trained unit is always keenly aware that (a) just about anything movable qualifies as a potential foreign object and (b) as a general rule somebody put it or left it where it is. Those paper cups and bottle tops and the assorted litter beside the runway didn't grow there all by themselves. Some Sloppy Joe dropped them there. And while he might be a crack mechanic or a red hot pilot when he's wide awake, he doesn't know much about FOD. Or he has forgotten. Or he doesn't care. In any case, he's not the kind of professional Army aviation has to have.

Well, so okay, maybe the paper cup blew there. Maybe the other litter fell off a passing truck. Why is it **still** there? Whose responsibility is it to pick it up, anyway? Everybody's. You see it first, you pick it up. And if you find a cotter pin, bolt, or nut near an engine, don't discard it until you have closely checked to see where it came from.

Foreign object damage, like just about everything else which can go wrong in the Army, is almost always preventable. And, like just about everything else, the ounce of prevention is so simple you find yourself wondering why everybody doesn't practice it faithfully all the time.

Alertness, professional pride, individual and unit responsibility-these are the tools to do the trick. If an aircraft has been maintained by a tool-conscious crew which has wound up the job by a thorough inside and out once-over for potential foreign objects, if the aircrew has every movable item secured, if the runways and ramps are cleaner than a Dutch housewife's kitchen-then your FOD worries are largely over. They are over, that is, if this sort of housekeeping is standard unit procedure that goes on night and day every day in the year. •



Sheared tail rotor drive shaft caused by paint brush. New brush is shown with brush that caused damage.



During a safety survey of an airfield, these objects were policed up from the ramp and helipads where aircraft were in operation.

Selected Aircraft Mishap Briefs

Information based on preliminary reports of aircraft mishaps reported in April 2015.

Utility helicopters

UH-60



-A Series. Crew was ground taxiing out of parking when the tail rotor made contact with wire fencing. Metal shards from the fence also resulted in fuselage damage. (Class B)

Unmanned Aircraft Systems

MQ-1C



-After take-off, the UA settled and impacted the runway then continued climb-out. The front and left-rear landing gear were unable to fully retract during its ascent. The crew diverted the UA for landing onto the airfield runway. (Class B)

RQ-7B



-Crew was conducting training when the UA experienced an engine failure at an altitude of 5,000 feet. Crew deployed the FTS chute and the system was recovered. (Class C)

Old aunts used to come up to me at family weddings, poking me in the ribs and telling me, "You're next!" They stopped after I began doing the same thing to them at funerals.

If you have comments, input, or contributions to Flightfax, feel free to contact the Aviation Directorate, U.S. Army Combat Readiness Center at com (334) 255-3530, DSN 558-3530



COMBAT READINESS CENTER

Online newsletter of Army aircraft mishap prevention information published by the U.S. Army Combat Readiness Center, Fort Rucker, AL 36322-5363. DSN 558-2660. Information is for accident prevention purposes only. Specifically prohibited for use for punitive purposes or matters of liability, litigation, or competition. Flightfax is approved for public release; distribution is unlimited.